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DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

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INTERDEPARTMENT CORRESPONDENCE

FILE: NH-STP-75-3(203) & STP-00MS(7) Gordon
P. I. Nos.: 610870 & 662510
I-75/Union Grove Interchange/South Calhoun Bypass

OFFICE: Engineering Services

DATE: December 5, 2007

FROM: Brian Summers, P.E., Project Review Engineer

TO: Babs Abubakari, P.E., State Program Delivery and Consultant Design Engineer

SUBJECT: IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES

Recommendations for implementation of Value Engineering Study Alternatives are indicated in the table below. Incorporate alternatives recommended for implementation to the extent reasonable in the design of the project.

ALT No.	Description	Savings PW & LCC	Implement	Comments
(I) I-75/Union Grove Road Interchange (P.I. No. 610870)				
I-1	Use AASHTO Type III Beams for bridge instead of 54' Bulb Tees	\$99,075	No	Would result in a higher stressed beam. The Type III Beams would also require special fabrication due to their higher strength.
I-2	Verify vertical clearance of 17'-0" vs. 17'-6"	Design Suggestion	No	The 17'-6" vertical clearance would result in a more costly bridge when compared to a 17'-0" clearance.
I-3	Shift alignment of Bridge $\pm 30'$ to the south to eliminate stage construction of bridge	\$273,768	No	The alignment as shown incorporates a compromise between the SHPO and the property owner.
I-5	Shorten lengths of Ramps C & D	\$336,573	Yes	This should be done.
I-6	Clarify MSE Wall locations	Design Suggestion	Yes	This should be done.

ALT No.	Description	Savings PW & LCC	Implement	Comments
(I) I-75/Union Grove Road Interchange (P.I. No. 610870) - continued				
I-7	Construct Ramps of Asphalt instead of PCC	-\$2,677,250 (Cost increase)	No	Results in a cost increase when Life Cycle Costs are considered over a 25 year period.
I-8	Construct Calhoun Bypass mainline (within the interchange project) of Asphalt instead of PCC	-\$4,847,270 (Cost increase)	No	Results in a cost increase when Life Cycle Costs are considered over a 25 year period.
I-9	Use portions of Bypass Project area as Borrow source	Design Suggestion	Yes	This should be done.
I-10	Shorten bridge, eliminate end spans, use MSE abutments	\$605,370	Yes	This should be done. This would still accommodate any future widening on I-75.
I-11	Eliminate Guardrail in locations of 4:1 slopes	\$34,100	Yes	This should be done.
I-15	Shorten spans over Interstate by using guardrail or concrete barrier along I-75	Design Suggestion	No	Would require guardrail or barrier wall to protect the Clear Zone.
I-16	Selectively reduce shoulder widths on ramps	\$573,924	No	The additional 6' of paved shoulders on the ramps would help prevent future maintenance problems associated with trucks parking on the ramps.
I-19	Widen bridge to increase left turn storage length	-\$1,953,221 (Cost increase)	No	Based on traffic projections, an adequate storage length has been provided.
I-20	Eliminate mast arm lighting standards in interchange	\$605,110	Yes	This should be done.
(C) South Calhoun Bypass (P.I. No. 662510)				
C-1	Optimize right of way takings	Design Suggestion	Yes	This should be done.
C-8	Reduce median width from 44' wide to 30' wide	\$1,063,454 (proposed) \$911,532 (revised)	Yes	A 32' median width will be used instead of a 30' width.

ALT No.	Description	Savings PW & LCC	Implement	Comments
(C) South Calhoun Bypass (P.I. No. 662510) - continued				
C-9	Construct eastbound roadway from S.R. 53 to U.S. 41 for two way traffic	\$6,475,524	Yes	This should be done. ←
C-10	Offset roadway east of Union Grove Road 34' from the centerline	Design Suggestion	No	There are no proposals at this time to widen this section of roadway over to S.R. 53 in the future.
C-11	Increase inside paved shoulder width from 2' to 4'	Design Suggestion	No	This would increase project costs.
C-13	Separate bridges at McDaniel Station Road/CSX & Oothkalooga Creek into four bridges instead of two bridges	Design Suggestion	Yes	This should be done.
C-14	Provide disposition for abandoned roadway/tie-in locations	Design Suggestion	Yes	This should be done.
C-16	Consider use of 3:1 fill slopes in areas where clear zone requirements can be met beyond toe of slope	Design Suggestion	No	There would be future maintenance issues with ensuring the clear zone is clear of vegetation.

A meeting was held on November 7, 2007 to discuss the above recommendations. Chris Rideout and William Ruhsam with Greenhorne and O'Mara, Stanley Hill, and Steve Adewale with Consultant Design and Brian Summers and Ron Wishon with Engineering Services were in attendance. Additional information was provided on November 13, 2007.

The above reflects the consensus of those in attendance and those that provided comments.

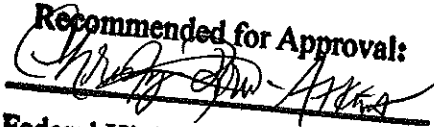
Approved:  Date: 12/17/07
Gerald M. Ross, P. E., Chief Engineer

Approved:  Date: 2/25/2008
for Rodney Barry, P.E., FHWA Division Administrator

BKS/REW

Attachments

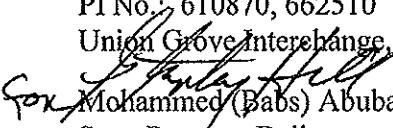
c: Gus Shanine/Christy Poon-Atkins
Todd Long
Stanley Hill
Steve Adewale
Lowell James
Lonnie Jones
Kenny Beckworth
Judy Meisner
Ken Werho
Nabil Raad
Melanie Nable
Lisa Myers

Recommended for Approval:

Federal Highway Administration

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE: NH-STP-75-3(203), STP-00MS(7), Gordon County OFFICE: Consultant Design
PI No.: 610870, 662510
Union Grove Interchange, South Calhoun Bypass DATE: October 23, 2007

FROM:  Mohammed (Babs) Abubakari, P.E.
State Program Delivery and Consultant Design Engineer

TO: Brian Summers, P.E., State Project Review Engineer

SUBJECT: Value Engineering Study-Responses

Reference is made to the recommendations that are contained in the Value Engineering Study Report dated May 14, 2007 for the above referenced projects. Our responses and recommendations are as follows:

1) **Value Engineering Alternative No. I-1 -- Use AASHTO Type III Beams for Bridge instead of 54" Bulb Tees**

Approval of the VE Alternative No. I-1 is not recommended.

- The Cross Section LF has been revised since first submitted to now show 10 beams spaced at 8 feet 9 inches. In lieu of this revision the quantity as shown in the VE study for LF of Bulb Tee should be adjusted to 1984 ft, to replace the 2160 LF shown.
- The cost per unit used in the study for the Type III beams appears to be the average for the year 2006. We believe this will not accurately depict the true cost of the beams as these beams will be the costliest of Type III beams, not the average, due to the fact that the required strength will likely be 10,000 psi. Assuming a 10-15% markup in the price the cost savings is reduced significantly. In years prior to 2006, the cost of a type III and a 54 BT were much closer than 2006, and we believe the 2006 numbers may be a bit of an anomaly. Additionally, these high strength Type III beams will require special fabrication due to their high strength.
- We believe it prudent to use a larger sized beam (54 BT) at normal capacity rather than a smaller beam at its absolute maximum strength and stress when the cost differences are this close.

2) **Value Engineering Design Suggestion No. I-2 -- Verify Vertical Clearance of 17'-0" vs. 17'-6"**

Approval of the VE Design Suggestion No. I-2 is not recommended.

- The use of a 17'-0" clearance for the interstate crossover bridge has been verified. This is the recommended clearance preferred by the GDOT Bridge Office for Interstate bridges.

3) **Value Engineering Alternative No. I-3 -- Shift Alignment at bridge 30' ± to south to eliminate stage construction of bridge**

Approval of the VE Alternative No. I-3 is not recommended.

- The Alignment as set prior to the VE Study incorporates compromises between the State Historic Preservation Office and Shaw Industries, Inc. Revising the alignment at the bridge would require

revisiting this compromise, negatively impacting the schedule for the environmental document and right of way acquisition.

- 4) **Value Engineering Alternative No. I-5 – Shorten Lengths of Ramps C and D**
Approval of the VE Alternative No. I-5 is recommended for implementation.
 - Shortening the ramps will reduce the amount of R/W necessary for constructing the interchange project.
- 5) **Value Engineering Design Suggestion No. I-6 – Clarify MSE Wall locations**
Approval of the VE Design Suggestion No. I-6 is not recommended.
 - All MSE walls illustrated in the concept are unneeded. No MSE Walls from the Concept will be included in the final design.
- 6) **Value Engineering Alternative No. I-7 – Construct ramps of asphalt instead of PCC**
Approval of the VE Alternative No. I-7 is not recommended.
 - Utilizing asphalt for ramp paving instead of PCC is a GDOT District 6 policy on interstate ramps.
- 7) **Value Engineering Alternative No. I-8 – Construct Calhoun Bypass mainline (within the interchange project) of asphalt instead of PCC**
Approval of the VE Alternative No. I-8 is not recommended.
 - It is a GDOT policy to install PCC pavement between ramp terminals on an interchange. Note that only 40% (approximately 1,220') of the interchange mainline is proposed to be PCC. Asphalt will be installed on the remaining portion of the mainline.
- 8) **Value Engineering Design Suggestion No. I-9 – Use portions of the Bypass project as Borrow source**
Approval of the VE Design Suggestion No. I-9 is not recommended.
 - GDOT projects do not include provisions for borrow pits as a matter of policy. This is left to the contractor
- 9) **Value Engineering Alternative No. I-10 – Shorten Bridge, eliminate end spans, use MSE abutments**
Approval of the VE Alternative No. I-10 is not recommended.
 - While using MSE abutments will likely result in a significant cost savings, it will limit future expansions of the roadway, will not provide the same sight distances as bridges on end rolls, and are susceptible to settlement issues from the retained earth behind the wall
- 10) **Value Engineering Alternative No. I-11 – Eliminate guardrail in locations of 4:1 slopes**
Approval of the VE Alternative No. I-11 is recommended.
 - Any guardrail shown on 4:1 slopes was an error. 4:1 slope is recoverable and will not be protected by guardrail.
- 11) **Value Engineering Design Suggestion No. I-15 – Shorten spans over Interstate by using guardrail or concrete barrier along I-75**
Approval of the VE Design Suggestion No. I-15 is not recommended.
 - Shortening the spans will reduce construction costs, but introducing barrier or guardrail places an obstruction in the clear zone that may lead to collisions. For safety considerations, Interstate bridge piers will be placed outside of the roadway clear zone.

- 12) **Value Engineering Alternative No. I-16 – Selectively reduce shoulder widths on ramps.**
Approval of the VE Alternative No. I-16 is not recommended.
- Existing outside shoulder specifications for interchange ramps (14' with 12' paved) is a design utilized on other sections of I-75 throughout the state.
- 13) **Value Engineering Alternative No. I-19 – Widen Bridge to increase left turn storage length.**
Approval of the VE Alternative No. I-19 is not recommended.
- Sufficient storage for project turning volumes is already provided. In the design year, the 95th Percentile back-of-queue for left turning traffic is within the design parameters of the left turn bays.
- 14) **Value Engineering Alternative No. I-20 – Eliminate Mast Arm lighting standards in interchange.**
Approval of the VE Alternative No. I-20 is not recommended.
- In order to meet the requirements that GDOT maintains for lighting, a mixture of high- and low-mast lighting is used. To meet specifications without low-mast lighting would require more high mast lighting, impacting the cost savings this recommendation is intended to address.
- 15) **Value Engineering Design Suggestion No. C-1 – Optimize right of way takings.**
Approval of the VE Design Suggestion No. C-1 is recommended for implementation
- Right of Way limits will be optimized during the later stages of preliminary design.
- 16) **Value Engineering Alternative No. C-8 – Reduce median width from 44' wide to 30' wide**
Approval of the VE Alternative No. C-8 is not recommended.
- A 44' depressed grassy median width is the current GDOT standard for rural divided arterials. Whereas reducing the width of the median will undeniably have a positive impact on project costs, there is no specific design- or safety-related reason to use a reduced width.
- 17) **Value Engineering Alternative No. C-9 – Construct eastbound roadway from SR 53 to US 41 for two way traffic**
Approval of the VE Alternative No. C-9 is not recommended
- Does not meet the Need and Purpose of the project. The Need and Purpose states, "The proposed South Calhoun Bypass will divert through traffic [on SR 53] from the commercial area of SR 53 and specifically help reduce the through truck traffic in the area." The intent of this project is to route large-capacity vehicles, i.e. tractor-trailer combinations on their way to I-75 away from the downtown areas of the City of Calhoun. Providing positive separation of vehicles by building a rural 4 lane divided section will be the safest and most efficient type of roadway.
- 18) **Value Engineering Design Suggestion No. C-10 – Reduce Offset roadway east of Union Grove Road 34' from centerline**
Approval of the VE Design Suggestion No. C-10 is not recommended
- This suggestion refers to the proposed two-lane section of the South Calhoun Bypass east of Union Grove Church Road, connecting to SR 53 on the eastern terminus. It is intended to allow for future expansion of this section of roadway to four-lane divided. However, the concept for this project does not envision further expansion in the future and does not incorporate R/W purchases to account for future construction. Offsetting the two-lane construction to account for future expansion will require changes to the R/W limits and is therefore not recommended.

19) Value Engineering Design Suggestion No. C-11 – Increase inside paved shoulder width from 2' to 4'

Approval of the VE Design Suggestion No. C-11 is not recommended

- Currently, GDOT policy calls for 2' of inside paved shoulder. There are no overriding reasons to deviate from this policy on these projects.

20) Value Engineering Design Suggestion No. C-13 – Separate bridges at McDaniel Station Road/CSX & Oothkalooga Creek into four bridges instead of two bridges

Approval of the VE Design Suggestion No. C-13 is recommended for implementation

- Between distribution of the VE Study materials and the VE Study Report, this recommendation was already implemented by the bridge design consultants.

21) Value Engineering Design Suggestion No. C-14 – Provide disposition for abandoned roadways/tie-in locations

Approval of the VE Design Suggestion No. C-14 is recommended for implementation

- Any roadway being cut/abandoned will have details on the construction plans illustrating what specific work is to occur, whether it is obliterate-grade-to-drain, cul de sac, or relocated tie-in. All existing access will be maintained through alternate routes if necessary.

22) Value Engineering Design Suggestion No. C-16 – Consider use of 3:1 fill slopes in areas where clear zone requirements can be met beyond toe of slope.

Approval of the VE Design Suggestion No. C-16 is not recommended

- While this is an innovative approach to reducing costs by reducing earthwork, it is non-standard and may not be applied well in the field. As noted on the Design Suggestion Form, maintenance crews will need to ensure that the clear zone beyond the toe of slope is clear of vegetation. Crews generally mow slopes to the toe and no farther. A failure in maintenance would increase the likelihood of a clear zone violation and therefore a run-off-the-road collision.

MBA:SA:wmr

Cc: Lisa Meyers, Design Review Manager, GDOT

Wishon, Ron

From: RUHSAM, William [WRUHSAM@G-and-O.com]
Sent: Tuesday, November 13, 2007 4:23 PM
To: Wishon, Ron; Hill, Stanley; RIDEOUT, Chris; Adewale, Steve (Adesoji)
Cc: Summers, Brian
Subject: RE: VE Implementation --- South Calhoun Bypass --- Gordon Co.

Ron,

See below for our responses to the various comments. Also, as a natural extension of C-9, the two-lane option, it would make sense to eliminate half of the parallel bridge spans that would not be used due to no pavement. This would result in more cost savings.

Bill

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From: RUHSAM, William
Sent: Friday, November 09, 2007 10:50 AM
To: 'Adewale, Steve (Adesoji)'
Subject: 610870/662510 Functional Classification

Steve,

The existing functional classification of Union Grove Road is Urban Collector, not Urban Local as I had thought.

With respect to the various action items from the VE Implementation Meeting:

- 1) We recommend a 32' median rather than a 30' median to satisfy VE Alternative C-8. While 30' would be acceptable to the AASHTO design standards, the GDOT median break design standards details a 60', 44' and 32' median. To ease construction, we believe a 32' median would be most appropriate.
- 2) There has been a sea change in Lighting Standards since the last time I conversed with our lighting subconsultant. Accordingly, all low-mast lighting will be removed from the project, leaving only the high-mast, in accordance with recommendation I-20.
- 3) With respect to VE Alternative C-9, "Construct eastbound roadway from SR 53 to US 41 for two way traffic", the level of service for a two-lane roadway goes from C to D in approximately 2029, therefore we recommend the two-lane option rather than full construction of four lanes.
- 4) Cover sheets and Supporting Documents for I-3 will be couriered to you today.

Bill

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From: Wishon, Ron [mailto:Ron.Wishon@dot.state.ga.us]
Sent: Tuesday, November 13, 2007 4:00 PM
To: Hill, Stanley; RIDEOUT, Chris; RUHSAM, William
Cc: Summers, Brian
Subject: VE Implementation --- South Calhoun Bypass --- Gordon Co.

Hey guys:

I seem to remember that we are waiting on some additional information from you before a determination is made on C-9. Have you had a chance to evaluate this one yet? Thanks!

C-9	Construct eastbound roadway from S.R. 53 to U.S. 41 for two way traffic	\$6,475,524	Yes?	Need more info from the Design Consultant.
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Ron Wishon
Assistant Project Review Engineer
Engineering Services
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404-463-6131 (FAX)